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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte J.G. WALACAVAGE, and JIM D. COBURN

Appeal 2009-000939
Application 09/965,904
Technology Center 2100

Decided: September 28, 2009

Before JEAN R. HOMERE, ST. JOHN COURTENAY III, and STEPHEN C. SIU, *Administrative Patent Judges*.

COURTENAY, *Administrative Patent Judge*.

DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134(a) from the Examiner's final rejection of claims 1-15, which are all of the claims before us on appeal. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.

STATEMENT OF THE CASE

Invention

Appellants' invention relates to programmable logic controllers. More particularly, the invention on appeal relates to logical modeling of operator interaction with a programmable logic controller logical verification system for manufacturing a motor vehicle. (Spec. 1, ll. 14-18).

Claim 1 is illustrative:

1. A method of logical modeling operator interaction with a programmable logic controller logical verification system, said method comprising the steps of:

constructing a flowchart that describes interaction of an operator in a workcell using a computer wherein such interaction comprises sequential operations and asynchronous operations, the asynchronous operations being not time dependent;

modeling the operator as an input to a programmable logic controller (PLC) by writing a control model of the operator interaction in the workcell based on predefined conditions described in the flowchart;

testing the control model by a PLC logical verification system on the computer as to whether PLC logic for the workcell is correct; and

loading the PLC logic in the PLC controlling the workcell if the PLC logic for the workcell is correct and using the PLC logic by the PLC to operate the workcell.

Prior Art

The Examiner relies on the following references as evidence:

Banks, "Handbook of Simulation Principles, Methodology, Advances, Applications, and Practices," 1998, pp.519-545.

Schruben, "Simulation Modeling with Event Graphs," Vol. 26, num. 11, Nov. 1983, pp. 957-963.

The Examiner's Rejection

The Examiner rejected claims 1-15 under 35 U.S.C. § 103(a) as being unpatentable over the combination of Banks and Schruben.

Rather than repeat the arguments of Appellants or the Examiner, we refer to the Briefs and the Answer for their respective details.

FINDINGS OF FACT

In our analysis *infra*, we rely on the following findings of fact (FF):

Specification

1. Appellants' Specification describes that interaction of an operator consists of two segments (1) "sequential operation where the operator functions as an integral part of the sequential cycle of a workcell, thereby causing certain logic conditions to be set in the PLC logic (ex: loading/unloading a part each cycle; and (2) interrupt or exception behavior where the operator responds to asynchronous request for the workcell." (Spec. 3, ll. 15-21).

Schruben

2. Schruben discloses that an operator is responsible for loading and unloading parts that are processed by a machine as well as freeing a jammed machine. (Schruben p. 959, 1st col.).

3. Schruben discloses that time required to repair a jammed machine is random. (*See id.*)

4. Schruben discloses that the event vertices include loading and unloading a machine, and operator breaks. (*See id.* 2nd col., "Event 2," "Event 7," and "Event 8.")

5. Schruben discloses an event graph for the Semiautomatic Machine system. The event graph vertices and state variables are defined in the text. (Schruben Fig. 2)

Banks

6. Banks teaches the use of a programmable logic controller (PLC) in the context of a control system. (p. 539, § 14.3.6).

APPELLANTS' CONTENTIONS

1. Appellants contend that the cited references fail to teach or suggest the limitation of constructing a flowchart that describes interaction of an operator in a workcell using a computer, wherein such interaction comprises sequential operations and asynchronous operations, the asynchronous operations being not time dependent. (App. Br. 15; *see also* claim 1).

2. Appellants contend that the cited references fail to teach or suggest modeling the operator as an input to a programmable logic controller

(PLC) by writing a control model of the operator interaction in the workcell based on predefined conditions described in the flowchart. (App. Br. 17; *see also* claim 1).

3. Appellants contend that Schruben discloses discrete event simulations which are timed based and therefore, are not "asynchronous operations" as claimed. (Reply Br. 3).

ISSUES

Based upon our review of the administrative record, we have determined that the following issues are dispositive in this appeal:

1. Have Appellants shown the Examiner erred in determining that the cited references teach or suggest the limitation of constructing a flowchart that describes interaction of an operator in a workcell using a computer, wherein such interaction comprises sequential operations and asynchronous operations, the asynchronous operations being not time dependent?

2. Have Appellants shown the Examiner erred in determining that the cited references teach or suggest modeling the operator as an input to a programmable logic controller (PLC) by writing a control model of the operator interaction in the workcell based on predefined conditions described in the flowchart?

PRINCIPLES OF LAW

Claim Construction

"[T]he PTO gives claims their 'broadest reasonable interpretation.'" *In re Bigio*, 381 F.3d 1320, 1324 (Fed. Cir. 2004) (quoting *In re Hyatt*, 211 F.3d 1367, 1372 (Fed. Cir. 2000)).

Obviousness

"What matters is the objective reach of the claim. If the claim extends to what is obvious, it is invalid under § 103." *KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. 398, 419 (2007). To be nonobvious, an improvement must be "more than the predictable use of prior art elements according to their established functions." *Id.* at 417.

> Invention or discovery is the requirement which constitutes the foundation of the right to obtain a patent . . . unless more ingenuity and skill were required in making or applying the said improvement than are possessed by an ordinary mechanic acquainted with the business, there is an absence of that degree of skill and ingenuity which constitute the essential elements of every invention.

Dunbar v. Myers, 94 U.S. 187, 197 (1876) (citing *Hotchkiss* v. *Greenwood*, 52 U.S. 248, 267 (1850)) (*Hotchkiss* v. *Greenwood* was cited with approval by the Supreme Court in *KSR*, 550 U.S. at 406, 415, 427).

Appellants have the burden on appeal to the Board to demonstrate error in the Examiner's position. *See In re Kahn*, 441 F.3d 977, 985-86 (Fed. Cir. 2006). Therefore, we look to Appellants' Briefs to show error in the Examiner's proffered prima facie case.

Grouping of Claims

Based on Appellants' arguments in the Appeal Brief, we will treat claim 1 as representative of claims 1-15. *See* 37 C.F.R. § 41.37(c)(1)(vii).

ANALYSIS

Issue 1

We decide the question of whether Appellants have shown the Examiner erred in determining that the cited references teach or suggest the limitation of constructing a flowchart that describes interaction of an operator in a workcell using a computer, wherein such interaction comprises sequential operations and asynchronous operations, the asynchronous operations being not time dependent. (Representative claim 1).

At the outset, we broadly but reasonably construe the limitation "not being time dependent," to encompass not being dependent upon a particular or specified time. For example, we find an event that occurs asynchronously at random is "not being time dependent" because the random event is not scheduled to occur at any particular or specified time.

We find that Schruben discloses an event graph. (FF 5). We find the event graph is a flow diagram (flowchart) of the Machine System disclosed in Schruben, because the event graph shows a flow of events that describe the machine system. We further find that the event graph describes interaction of an operator (i.e., start loading the machine, finish loading the machine) in a work cell as claimed. (*See* FF 2 and 5).

As noted above, Appellants further contend that Schruben does not teach or suggest asynchronous operations that are not time dependent. (App.

Br. 15). We disagree. Appellants' Specification describes an asynchronous operation in terms of an "interrupt or exception behavior where the operator responds to asynchronous requests for the workcell." (FF 1). As noted above, Schruben teaches both starting and finishing the repair of a jammed machine. (See FF 3). Therefore, it is our view that the scope of the claimed asynchronous operations broadly encompasses the jammed machine described in Schruben because the jammed machine is an asynchronous interruption of the normal machine (cell) operation. (FF 1 and 3).

We observe that Schruben discloses that the time required to repair (start to finish) a jammed machine (asynchronous event) is *random*, and therefore the time required to do so is unspecified (FF 3). Thus, we find the time for repairing Schruben's jammed machine is described as not being based on a specific or particular time, i.e., not being time dependent, according to our aforementioned construction.

Thus, we find that Schruben teaches an asynchronous operation (repairing a jammed machine) that is "not time dependent" (i.e., random). Accordingly, we do not find Appellants' arguments to be persuasive in showing error in the Examiner's rejection.

Issue 2

We decide the question of whether Appellants have shown the Examiner erred in determining that the cited references teach or suggest modeling the operator as an input to a programmable logic controller (PLC)

by writing a control model of the operator interaction in the workcell based on predefined conditions described in the flowchart. (Representative claim 1).

As noted above, Schruben describes the operator's behavior in the event graph (flowchart), as claimed. The event vertices in "Event 8" and "Event 9," for example, include predefined conditions such as the operator's break time. (FF 4 and 5). As pointed out by the Examiner (Ans. 12), Banks teaches the use of a PLC in the context of a control system. (FF 6). We note that the Examiner's rejection is based on the combination of references. Thus, we see Appellants' argued limitations as nothing more than the predictable use of prior art elements according to their established functions. Based on the evidence before us, we do not find Appellants' arguments persuasive to show error in the Examiner's prima facie case of obviousness.

For at least the aforementioned reasons, we find Appellants have not shown error in the Examiner's rejection of representative claim 1. We note that Appellants present arguments for remaining independent claims 9 and 15 that are commensurate with the arguments presented for independent claim 1. (App. Br. 19-28). Accordingly, we sustain the Examiner's obviousness rejection of representative claim 1, and claims 2-15 which fall therewith.

CONCLUSIONS

Appellants have not shown the Examiner erred in determining that the cited references teach or suggest the limitation of constructing a flowchart that describes interaction of an operator in a workcell using a computer,

wherein such interaction comprises sequential operations and asynchronous operations, the asynchronous operations being not time dependent.

Appellants have not shown the Examiner erred in determining that the cited references teach or suggest modeling the operator as an input to a programmable logic controller (PLC) by writing a control model of the operator interaction in the workcell based on predefined conditions described in the flowchart.

DECISION

We affirm the Examiner's rejection of claims 1-15 under 35 U.S.C. § 103(a).

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED

pgc

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